TRANSLATION

(19) FEDERAL REPUBLIC OF GERMANY
GERMAN PATENT OFFICE
(11) PATENT NO. 3,119,636 A1
(12) (Offenlegungsschrift)

(51) Int. Cl.^{3}: D 04 B 23/10
D 05 C 15/18

(21) Application No.: P 31 19 636.5

(22) Application Date: May 18, 1981

(43) Date Laid-Open to Public Inspection: June 24, 1982

(3) Priority:
Date: November 20, 1980
Country: German Democratic Republic
No.: WP D04B/225345

(54) DEVICE FOR OPENING THE PILE LOOPS ON MULTIPLE-NEEDLE MACHINES, ESPECIALLY STITCH-KNITTING MACHINES

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The invention pertains to a device for opening the pile loops on multiple-needle machines, especially stitch-knitting machines, whereby the pile loops formed from threads, fleece or the like by means of pile sinkers and securely bound on or in a fabric base are opened on the machine. The device for opening the pile loops consists essentially of the cutter, the cutting edge of which runs the full width of the stitch-knitting machine and makes elastic or rigid contact with the front side of the tips of the pile sinkers, on which the pile loops are formed. Here the cutter is affixed to a bar parallel to the stitch-knitting point, which executes a constant back and forth movement.

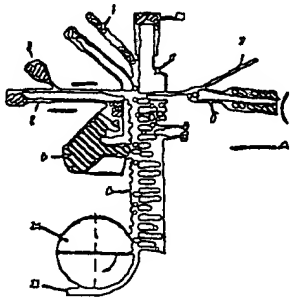

Figure 1

Claims

1. Device for opening the pile loops on multiple-needle machines, especially stitch-knitting machines, whereby the pile loops formed from threads, fleece or the like by means of pile sinkers and securely bound on or in a fabric base are opened on the machine, characterized in that the cutter for opening the pile loops (8) is affixed to a laterally displaceable bar (12) paralleling the stitch-knitting point, while the cutting edge (10) of the cutter runs the full width of the multiple-needle machine and makes elastic or rigid contact, which can be adjusted as to height, with the front side of the pile sinkers

(5), on which the pile loops (8) are formed, until the latter reach the area of the cutting edge (10) and are opened.

2. Device according to Claim 1, characterized in that the cutting edge (10) of the cutter is formed by individual cutting elements, e.g., blades, arranged side by side, preferably in one plane.

3. Device according to Claims 1 and 2, characterized in that the cutting edges (10) are arranged in different planes, whereby a pile opening according to a given pattern can be simultaneously produced.

4. Device according to Claim 2, characterized in that the cutter consists of a rotating band (29), preferably a metal band with a cutting edge (10), guided over rollers (31).

5. Device according to Claims 1 and 2, characterized in that the bar (12) bearing the cutter is operated via a cam drive (20, 21) by a separate motor (15) so as to be laterally displaceable.

6. Device according to Claims 1 and 2, characterized in that the drive of the bar (12) bearing the cutter is derived from the main drive of the multiple-needle machine.

7. Device according to Claims 1 and 4, characterized in that the rotating band (29) with the cutting edge (10) is preferably provided with a separate drive (15).

The invention pertains to a device for opening the pile loops on multiple-needle machines, especially stitch-knitting machines, whereby the pile loops formed from threads, fleece or the like by means of pile sinkers and securely bound on or in a fabric base are opened on the machine.

A device for cutting open the pile loops drawn into a fabric base is known (DD-PS 71 597), in which the pile sinkers are designed as double sinkers. Freely movable flat blades are contained in the double sinkers, the cutting direction of which is preferably toward the material take-off direction. The bar bearing the flat blades is driven by a cam or eccentric drive, so that the flat blades execute a movement in the form of a

closed curve, e.g., a circle or an ellipse, in the double sinkers and the pile loops are cut open thereby.

With this known device it is not possible, however, to achieve fine divisions as known in the case of high pile densities. The guiding of the cutting blades in the double sinkers dictates an enlargement of the individual pile sinkers, so that the cutting device makes possible only rough divisions. Furthermore, with increased density of the needles, exact filling of the cutting blades during essential replacement becomes increasingly difficult.

Fundamental to the invention is an objective of creating a device, in which the pile formation and the opening of the pile loops takes place with functional precision with any density of pile loops, especially with high pile densities. The needles used to tie in the pile loops, preferably slide needles, must not touch the pile sinkers and the cutting elements even with high machine fineness, and the respective threads or fibers being used must be engaged safely by the needles. The pile loops should be cut in a quality manner, in which they exert the least possible resistance to the cut. The cut must be made definitively, so that no pile loops remain unopened.

This objective is realized by the characteristics set forth in Claims 1-7.

With the device of the invention, it is possible for the pile loops formed by means of the pile sinkers to be advanced to the cutting point in the erect state without any need for further strengthening. At the same time, as a result of the erect advance of the pile loops to the cutting point, the individual pile loops can be opened exactly in the middle, which ensures a uniform surface of the finished pile product. Furthermore, due to the placement of the cutter on the pile sinkers, assurance is given that, as a result of the constant displacement movement of the cutting edge directly on the pile sinker, each and every pile loop positioned thereon is guaranteed to be opened.

In addition, the device of the invention permits the opening of the pile loops independently of the width of the machine and the fineness, i.e., the density, of the pile loops on multiple-needle machines, since the positioning of the cutter between the pile sinkers is avoided thereby. Furthermore, the device can be employed for all pile loop heights and all types of pile loop material, such as threads, narrow ribbons, fibers, etc.

An embodiment of the invention is explained with reference to the appended Figures 1-5. Depicted are:

Figure 1, the arrangement of the cutter at the stitch-knitting point in schematic representation;

Figure 2, a view of Figure 1 in direction A;

Figure 3, the drive of the cutter in schematic representation;

Figure 4, the schematic representation of the cutter in the embodiment as a rotating band;

Figure 5, the arrangement of the rotating cutting band at the stitch-knitting point in schematic representation.

As shown in Figure 1, the basic track (1) is pierced by the slide needle (2) with the closing wire (3), while it is advanced between the mounting of the knocking-over sinker (4) and the pile sinker (5) toward the stitch-knitting tools. The eye needle (6) guides the pile thread (7) received from another slide needle of the preceding mesh-forming cycle and, following a lateral displacement movement, places it in the hook of the slide needle (2). In the return movement of the slide needle (2), the pile thread (7) is formed over the pile sinker (5) into pile loops (8) and laid off to the left side of the material in the form of a needle wale (9). The cutter for opening the pile loops (8) consists of a cutting edge (10) running transversely to the stitch-knitting point, which in the embodiment is formed by a row of cutting blades arranged side by side. These cutting blades forming the cutting edge (10) are securely threaded onto a spring steel sheet (11), which is mounted on the bar (12). The bar (12) is rigidly joined to a lever (13), which is mounted on

the shaft (14). The bar (12) is set into back and forth movement by the shaft (14).

As shown in Figure 3, the drive shaft (19) of a friction ring drive (18) is driven by a separate electric motor (15) via a V-belt drive (16, 17). By the drive shaft (19) and via the cam disk (20) and the cam (21), the lever (22) is moved, which imparts a lateral displacement movement to the shaft (14), on which the bar (12) is mounted. Located on the clamping lever (24), which is also mounted on the shaft (14), are springs (23), which are provided for the return of the shaft (14) or the bar (12) and effect a displacement movement in the other direction. The lever (22) is fixed in place by the arresting lever (25), the arresting pin (26), and the arresting plate (27).

In another embodiment example, the drive of the shaft (14) can be derived directly from the main drive of the multiple-needle machine. Here, the transfer also takes place via a V-belt drive from the undepicted main shaft of the machine to the drive shaft (19) of the drive (18) and the cam drive (20, 21, 22) to the shaft (14).

As Figure 1 illustrates, the pile loops (8) lie directly over the pile sinkers (5) in the basic track (1). The pile loops (8) are drawn off in the direction of the arrow with the finished pile product (33) by the product withdrawal beam (34). Here, approximately every fifth pile loop (8) of those on the pile sinker is moved into the area of the cutting edge (10). As shown in Figure 2, the cutting edge (10) makes contact with the front side of the pile sinkers (5) and executes a constant back and forth movement. The pile loops (8) passed directly over the cutting edge (10) are opened thereby.

In an embodiment according to Figure 4, the cutter is designed as an endless cutting band (29), which is mounted in an elastic guiding means, e.g., a rubber band (30), the polished cutting edge (10) of which also makes contact with the front side of the pile sinker (5) and is constantly moved past it (Figure 5). To this end, the cutting band (29) is passed over guide rollers (31) and ball bearings (32). The drive is provided

by the guide roller (31a). By means of pressure plates (28) the cutting band (29) is pressed firmly against the front side of the pile sinkers (5), so that the pile loops (8) drawn into the area of the cutting edge (10) are constantly opened.

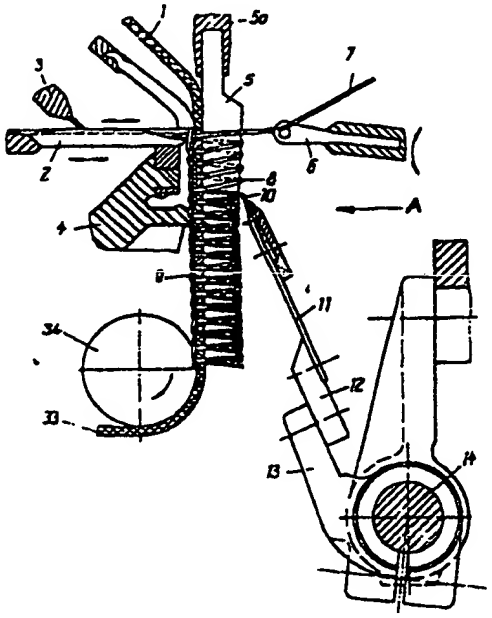

Figure 1

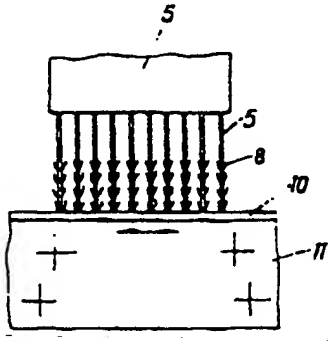

Figure 2

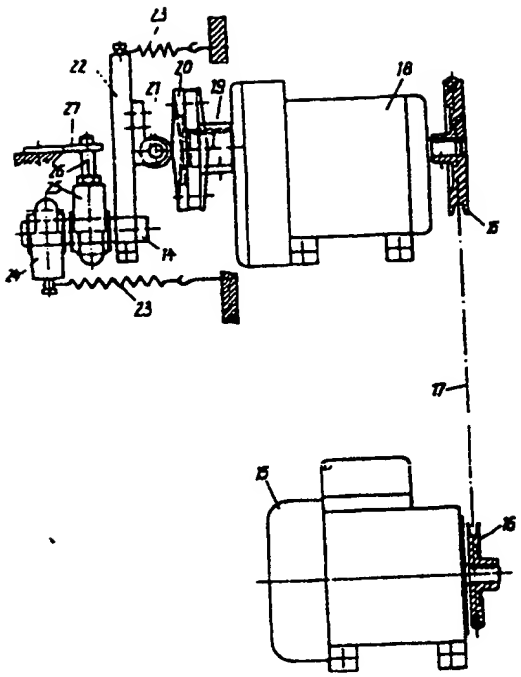

Figure 3

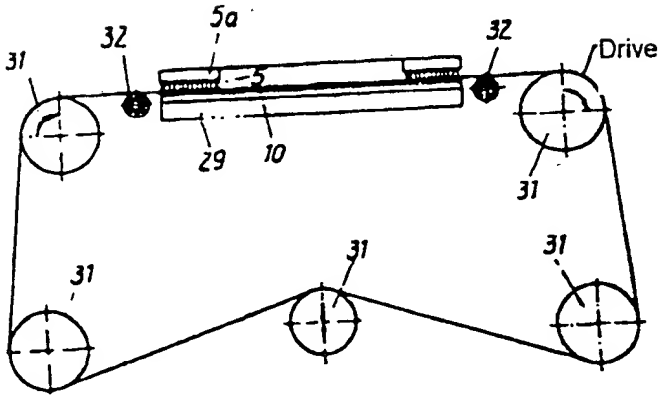

Figure 4

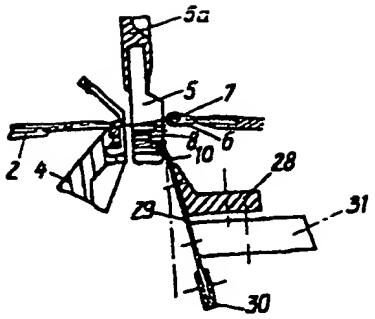

Figure 5

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NOVEMBER 4, 1998